

Docket No. 10991507-1

Remarks

Claims 1, 2, 4, 5, 7-11, 14-17, and 20 remain in this application. Claims 3, 6, 12, 13, 18 and 19 have been cancelled. Claims 1, 4, 7, 11, 14, and 16 have been amended. Claim 20 has been added. Claims 1, 11, 16 and 20 are independent claims.

A. Claim 14

In an Office action dated August 18, 2003, the specification was objected to as failing to provide proper antecedent basis for the subject matter of claim 14. Moreover, claim 14 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In response, Applicant has amended the claim to be consistent with the specification as originally filed and has amended the claim to satisfy the requirements of Section 112, second paragraph.

Amended claim 14 describes the input optical paths of the optical switch as being in a parallel relationship and provides a clearer description of the matrix of junctions formed by intersecting the "input optical paths" with the "drop signal paths" and the "add signal paths." There are $(N+1) \times N$ junctions within the matrix, where N is the number of input optical paths, the number of drop signals, and the number of add signal paths.

Support for the amended claim 14 may be found by viewing Fig. 4 of the application as originally filed. In the example embodiment of Fig. 4, $N = 4$, since there are four optical paths that originate at the input ports (110, 112, 114 and 116), four add signal paths that originate at the add ports (134, 136, 138 and 140), and four drop signal paths that terminate at the drop ports (126, 128, 130 and 132). There are a total of twenty junctions formed by the intersections of the input optical paths with the drop signal paths and the add signal paths. That is, $(N+1) \times N = 20$.

Applicant respectfully requests reconsiderations of the objection to the specification and reconsideration of the rejection under Section 112, second paragraph, in view of the amendment to claim 14.

B. Rejections Based upon Prior Art

Claims 1 and 16 were rejected under 35 U.S.C. 102(a) as being anticipated by Sakata et al. (JP 2000-032510). Claims 11 and 15 were

rejected under 35 U.S.C. 103(a) as being unpatentable over Sakata et al., while claims 2-5, 12, 17 and 18 were rejected further in view of Fouquet et al.

As will be described in detail below, Applicant has amended the claims to patentably distinguish the claimed invention from the cited prior art. Reconsideration of the claims is requested.

C. Allowable Subject Matter

In the Office action, claims 6-10, 13, 14 and 19 were identified as containing allowable subject matter. However, the claims were objected to as being dependent upon rejected base claims. Applicant notes with appreciation that reasons for determining that the claims are allowable are presented in the Office action. On the basis of the indication of allowability, independent claims 1 and 16 were amended and independent claim 20 was added.

1. Allowability of Amended Claim 11

Claim 11 has been amended to incorporate substantially all of the features of claim 13 as originally filed. The only feature of original claim 13 which is not included within amended claim 11 is the description "both of said first and second trenches having an axis between said first and second intersections." In the identification of the reasons for allowance within the Office action, this minor feature was not included. Amended claim 11 does include the description of a switching arrangement which is operatively associated with an input optical path and which comprises a pair of trenches that are switched in unison between transmissive states and reflective states, depending upon the presence or absence of a fluid. Therefore, Applicant submits that the amendment to claim 11 places the claim and its dependent claims in an allowable condition.

2. Allowability of Amended Claim 16

Independent claim 16 has been amended to incorporate the allowable subject matter from claim 19. Consequently, it is submitted that amended claim 16 and dependent claim 17 are allowable over the prior art.

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3. Allowability of Added Claim 20

Independent claim 20 is a combination of claims 1 and 6 as originally filed. Claim 6 has been cancelled. Claim 7 has been amended to change its dependency from cancelled claim 6 to added claim 20.

Since original claims 6-10 were deemed to contain patentable subject matter when combined with base claim 1, Applicant submits that added claim 20 and dependent claims 7-10 are in a condition for allowance.

D. Rejection of Claim 1

Claim 1 was rejected under 35 U.S.C. 102(a) as being unpatentable over Sakata et al. To briefly state the standard, rejections under Section 102 are proper only when the claimed subject matter is identically disclosed or described in a single prior art reference. In re Marshall, 198 USPQ 344 (CCPA 1978). Applicant has amended claim 1 to include description of structural differences with respect to the switch of Sakata et al.

Amended claim 1 describes an optical switch in which one embodiment is illustrated in Fig. 6. The optical switch includes first optical paths having input ports (110, 112, 114 and 116) at one side and drop ports (126, 128, 130 and 132) at the opposite ends. In addition to the first optical paths, there are second optical paths having add ports (134, 136, 138 and 140) at first sides and having output ports (118, 120, 122 and 124) at the opposite sides. First and second demultiplexers (214 and 216) have outputs connected to the input and add ports. First and second demultiplexers (222 and 224) have inputs connected to the output and drop ports. Each switching arrangement of a plurality of two-state switching arrangements (102, 104, 106 and 108) is uniquely associated with a single one of the first optical paths. The two-state switching arrangements are configured such that the add ports remain optically decoupled from the drop ports, regardless of switching between transmissive and reflective states of the two-state switching arrangements.

Support for the amendment to claim 1 may be found in the description of Fig. 6 on page 11 of the application as originally filed. The feature of the add ports remaining decoupled from the drop ports is supported by comparing the configuration of a switching arrangement (102, 104, 106 and 108) of Fig. 6 to the configuration of a switching arrangement of Fig. 1.

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When any one of the switches is in a transmissive state, the signal from the input port passes through the trench to the port of the same optical path. On the other hand, when a switching arrangement is in a reflective state, the signal from the input port is reflected, but the signal from the add port is "lost." This can be seen graphically in Fig. 6, since the reflection will occur while a signal is within the add port (134, 136, 138 and 140). The feature is specifically described on page 2, lines 36-36, wherein it is stated when the switching unit is in the reflective state, the second input waveguide (24) is not in communication with the first output waveguide (26).

Applicant respectfully asserts that the cited reference to Sakata et al. does not anticipate a switching arrangement configured such that an add port remains optically isolated from drop ports. The switches of Sakata et al. have axes that dissect the intersections of optical paths. It is contended that the person of ordinary skill in the art would readily understand this configuration to be one in which add ports can be optically coupled to drop ports. Thus, the Sakata et al. optical switch has structural differences when compared to the optical switch described in claim 1, as amended.

It is further submitted that the combination of Sakata et al. and Fouquet et al. does not present a *prima facie* case of obviousness under Section 103(a). In amended claim 1, there is an arrangement of multiplexers, demultiplexers, optical paths and switches. The teachings of Fouquet et al. do not render it obvious to modify the Sakata et al. device to achieve the claimed arrangement of components. For example, it would not be obvious to "permanently" decouple the add ports from the drop ports of Sakata et al.

Applicant respectfully requests reconsideration of the claims in view of the amendments and remarks made herein. A notice of allowance is earnestly solicited. In the case that any issues regarding this application can be resolved expeditiously via a telephone conversation, Applicant invites the Examiner to call Terry McHugh at (650) 969-8458.

Respectfully submitted,

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